BOOK REVIEW

"BROADCASTING IN INDIA"

(A REVIEW OF THE REPORT* SPECIALLY OF CHAPTERS II AND

It is for the first time since April, 1930, when the control of Calcutta and Bombay radio stations passed over to the Government of India that an official report on the working of the Indian Broadcasting Administration up to 31st March, 1939, has been released to the public. During the next three years (1930-33), the Broadcasting in India made little progress and on one occasion it narrowly escaped being shut down. In January, 1934, the Government of India granted 2½ lakhs of rupees for a third medium-wave station at Delhi. The next year, a special fund of Rs. 20 lakhs was allotted and Mr. Fielden of the B.B.C. assumed charge as the first Controller of Broadcasting. In 1936, a further grant of Rs. 20 lakhs was added making a total of Rs. 40 lakhs; and Mr. Kirke of the B.B.C. arrived in India to suggest a scheme of expansion of broadcasting in this country.

KIRKE'S SCHEME AND AFTER

Kirke recommended the installation of seven medium-wave stations at various centres in addition to those existing at Delhi, Calcutta and Bombay and one short-wave station at Delhi for news transmission. He also proposed the purchase of the existing medium-wave station at Peshawar. Regarding the aerial power of medium-wave stations, he suggested 100 KW for one station, 5 KW for five stations and 2 KW for two stations. This scheme together with improvements on existing Calcutta and Bombay stations was estimated to cost Rs. 40·19 lakhs and the annual recurrent expenditure to Rs. 26 lakhs for the completed scheme.

In absence of data on reception conditions in India at different times of the year, an estimation of the areas which would be adequately served by his scheme could not be made, but it was predicted by him that the scheme would give 'A' service area with signal strength of 10 milli-volts per metre to about 14 million persons and 'B' service area with signal strength of 3 milli-volts per metre to

* Report on the Progress of Broadcasting in India, published by the Manager of Publications, Delhi, 1940.

35 million persons. It would be noted here that Kirke's forecast was subsequently found to be adequate for winter months only but not in summer months due to severe atmospheric disturbances prevailing in India.

Kirke wisely stressed in his report the necessity of establishing a Research Department and suggested taking up the work relating to (*a*) field-strength measurements, (*b*) transmission tests, (*c*) study of atmospheric disturbances, (*d*) recording of programmes and (*e*) development of radio links for relaying as well as advising the Engineering Department on the purchase of new radio and audio equipments.

He also dwelt in his report on the question of appointment of a suitable Chief Engineer to supervise technical and research departments and to build up a satisfactory organization As he did not seem to find in India any person (European or Indian) suitable for this appointment, he considered it desirable to bring a fully qualified man from England

Kirke's recommendations were based upon a compromise between providing service to urban areas from which large license revenues might be expected and providing such service to rural areas which might be partly maintained by revenues derived from urban areas.

After the return of Mr. Kirke to England, one of the B.B.C. engineers Mr. Goyder was appointed as the Chief Engineer in August, 1936. Mr. Goyder did not fully agree with Mr. Kirke's scheme. Considering the limited funds available to the Administration and the vastness of area to be served, he put forward a scheme of providing a basic second-grade short-wave service to the whole of the Indian continent and of supplementing the same by first-grade medium-wave service as funds become available. Kirke's scheme was modified as stated below. In addition to the existing medium-wave transmitters at Delhi, Calcutta, Bombay and Peshwar, installation of four 10-KW short-wave transmitters at each of the centres—Delhi, Calcutta, Bombay and Madras, one 5-KW short-wave news transmitter at Delhi, four 5-KW medium-wave transmitters at each of the centres—Lahore, Lucknow, Dacca and Trichinopoly and one 0·25-KW medium-wave transmitter at Madras were decided upon. The four 10-KW short-wave transmitters were regarded as almost covering the whole of India and providing a second-grade service not unsatisfactory to the average listener both by day and night. Goyder's scheme was accepted in preference to that of Kirke.

ENGINEERING AND TECHNICAL ACTIVITIES OF THE A. I. R.

The Engineering and Technical activities of the Department designated as the All India Radio (or A.I.R.) since June, 1936, have been presented in nine sections covering about 45 pages. They give an insight into the various classes of work which has been carried out during 1936-39 by the three departments of the Engineering Branch, namely, Research, Installation and Maintenance.

The results of field-strength measurements of the medium-wave stations at Lahore (5 KW), Lucknow (5 KW) and Delhi (20 KW) have been given. Direct ray measurements relating to Lahore have given average ground conductivity to be $1{\cdot}5 \times 10^{-13}$ e.m.u. and field strength varying between 30 and 59 mv/m over Lahore and between 7 and 8 mv/m over neighbouring district of Amritsar. Measurements relating to Lucknow have given average ground conductivity to be $1{\cdot}75 \times 10^{-13}$ e.m.u. and field strength varying between 28 and 58 mv/m over Lucknow and between 3·5 and 6·5 mv/m over Cawnpore. Measurements relating to Delhi have given average ground conductivity which varies from $1{\cdot}0 \times 10^{-13}$ to $1{\cdot}5 \times 10^{-13}$ e.m.u.'s. For a 5-KW station with normal ground conductivity prevailing in Northern India and assuming 20 *db* signal/noise ratio on 30% modulated signal, it will not be possible to maintain for 50% of time a range more than 50 miles and for 95% of time a range more than 11 miles. For 20-KW station, the range is about 70 miles for 50% of time and about 20 miles for 93% of time.

The measurements of indirect ray field strength of Indian medium-wave stations at Delhi during darkness hours are not without interest. In order to permit measurements on different stations to be compared, the measured figures have all been reduced to the equivalent field strength for one KW radiated. The figure shows the inverse-distance curve as well as the C.C.I.R. curve for a broadcasting station with 1 KW radiated. The field strengths of Lahore, Lucknow and Bombay stations approach the C.C.I.R. curve whereas those of Calcutta and Peshawar fall short of this.

It has been mentioned that the short-wave service in India is different from the short-wave services radiated from the European countries. Here in India the purpose of the service is to serve the area in which the station is located and hence the wave-lengths must be so chosen that they do not give skip distance around the station. Further to provide a short-wave service without skip distance over relatively short distances, the transmitting aerial must radiate energy at all vertical angles. An account of the experiments with half-wave horizontal dipole aerials placed at quarter wave-length and at half a wave-length above the electrical earth with reference to field strengths at nearer and farther points has been given.

A full section on the short-wave service is no doubt appropriate in the report of an administration which has adopted the basic scheme of providing second-grade short-wave service to India but it seems to be lacking in several essentials. The language and the method of presentation leave much to be desired. The interesting results arrived at from experiments on half-wave horizontal dipoles placed half a wave-length and quarter wave-length above the earth could have been presented in a much better way by enclosing some (quasi-maximum) field-strength—distance curves (up to 500 miles or more). Some results of 'fading studies' would also have been valuable.

A short account of the measurement of atmospheric disturbances is given. After discussing the two types of atmospherics—'long distance' and 'local,' the method of measurement has been described. Results of measurement for July, August and September, 1937, are given in the form of curves showing the signal field strength required in $\mu V/m$ with 30% modulated carrier to give 20 *db* signal/atmospheric ratio at various hours of the day on wave-lengths from 50 to 400 metres.

A description of the transmitting equipment and the associated aerial system of the short-wave and medium-wave transmitters installed by A.I.R. has been given in some details. The outstanding technical features have been brought out clearly and a number of figures has been enclosed to show schematic arrangement of connection, harmonic percentage and frequency response characteristics. An account has been presented in an interesting way of the Todapur receiving centre, which not only consists of aerial systems and equipments for diversity reception for rebroadcast purposes but serves also as the central observation station for periodical checking of wave-length, field strength and quality of transmission of A.I.R. stations. The figure which shows automatic gain control voltage variations with one, two and three receivers (of the diversity equipment) interlocked is interesting.

The studio design practice of the A.I.R. has been discussed at some length. After stressing on the need for a proper studio from listener's point of view, the three special requirements of studios, namely, (*a*) silence, (*b*) ventilation and (*c*) acoustics are discussed in details. The question of acoustic treatment then receives careful attention. Result of research leads to use of a 'vegetable fibre material' for sound absorption. With this material, instead of obtaining desired equal absorption over the audio-frequency range required, the absorption is high at higher frequencies and low at lower frequencies. To improve on this, the lower half of the total treated wall area has been proposed to be supported on battens in such a manner that energy on lower frequencies is absorbed. A number of reverberation time—frequency characteristics are given.

The village receiver problem has received due attention of the Research Department which has made experimental models based on their experiences of various difficulties. A tentative specification has been drawn up and circulated to the suppliers.

RESEARCH DEPARTMENT

In accordance with the recommendation of Mr. Kirke, a research department was created in April, 1937, with a research engineer and a technical staff of a few workers. Measurements of field strengths and atmospheric disturbances, experiments on diversity reception and acoustic treatment of studios and development of village receivers no doubt go to the credit of this new department. However, one cannot help remarking at this stage that both quality and quantity of the research

work leave much to be desired. A few cases of signal strength survey or a few sets of measurements on the strength of atmospherics during a period of two to three months can hardly be classed as research work.

The Research Department should be organised in a better way and strengthened for carrying on efficiently research and development works which are of immediate or future importance to the engineering side of broadcasting. The work and organization of the research department should be entrusted to a right sort of technical person having long research and development experience and capable of guiding research. A glance at the Appendix VII shows that the salary paid to the person entrusted with charge of the research department (*i.e.*, the Research Engineer) is a mere pittance in comparison to those of the other "senior headquarters officers" of the Administration. It may be difficult to attract the right sort of person for this purpose on this meagre salary. Similarly, the research staff—engineers and assistants—should have better salaries than those on maintenance and installation sides to attract first-grade men.

The head of the research department should be assisted by at least seven assistant research engineers and some twenty-five or more research assistants. The work of the research department could be carried out more or less under five main *divisions* as elsewhere :—(1) Signal strengths and Ionospheric measurements; (2) Atmospherics and Electrical Disturbances; (3) Aerials, feeders and diversity reception; (4) Studio acoustics, sound-recording and audio-frequency work; and (5) Equipments and Developments. For some of the work of this Department like ionospheric measurements, atmospheric measurements, etc., it would be desirable to open a few 'Observation Centres' in different parts of the country in addition to those located at the Headquarters and to obtain records of observation over sufficiently long periods. Finally, the publication of the results of investigations in suitable technical journals should form a part of research engineer's work.

CONCLUSION

In concluding the review, we will mention that no small credit is due to the chief executives connected with the Indian broadcasting service in view of the extent of the problem and the nature of difficulties to be surmounted. It is a tribute to their great enthusiasm and tenacity of purpose.

The report is profusely illustrated and contains numerous table, charts, graphs and diagrams supplying useful data. It is to be hoped that the next report will be published early.